"Effect of Circuit Training and Interval Training on Psychological and Physical Attributes Among 14-16 years Boys"

Research synopsis submitted the for award of Ph.D. degree in Physical Education

Swami Ramanandteerth Marathwada University, Nanded

Research Scholar
Sudhakar Sakharamji Deshmukh
M.A., M.P.Ed., M.Phil.

Research Guide,
Prof. Dr. Ganesh Solanke
M.A., M.P.Ed., Ph.D.
Assistant professor,
Sant Tukaram College, Dist. Parbhani. (M.S.)

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INDEX

Sr. No.	Content	Page No.
1	Introduction	3
2	Physical education	3
3	Sport training	4
4	Characteristics of sports training	7
5	Circuit training	12
6	Interval training	13
7	Important of the study	17
8	Hypotheses of the study	17
9	Definition of some important concept	19
10	Review of literature	20
11	Research methodology	23
12	Conceptual model	33
13	Literature cited	35

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I. Introduction :

1. Physical education

To live healthy life, happily and to develop wellness in human life, physical activity and physical fitness is necessary. Human body is made for physical movement and physical exercise. Physical activity is essential for harmonious physical and mental development. How to care our mind towards happiness, wealth, body and about health these things are known to us with physical education. Physical education is direct to us about better physical fitness. "Physical Education is an all encompassing term, including fitness, skills, movements, dance recreation, health game and sport plus the appropriate values and knowledge of each"

In physical education the factors like balanced plan, systematicness, follows particular pattern, maintain disciplines, individualisticness, perfection are essentials. Through these factors physical education direct physical fitness and individual development. So these characters shows interrelation of sports training and physical education. Characters of sports training are creating our good mind.

The performance level of sports person in various games and sports is considerably improving day by day. The last century and particularly the recent decades have witnessed a revolution in the field of sports for grooming young talent. The modern scientific way of sports training is different from that of early period.

For higher performance the adaptive functions of the organism are indispensable for optimum development.

Competition is the key in the field of physical education and sports previous records are being broken in the successive meet or competition. To achieve something in the high level competition one must undergo conditions and systematic plan of training right from child hood with the manipulation of physical and psychological factors.

2. Sports training

In sports word "Training is generally understood to be a synonym of doing physical exercise for the improvement of performance. Training is identified according to need of the components to be developed. The word training has been a part of human language since ancient time it denotes preparation for some tasks. This process invariably extends to a number of days and year. The term training is widely used in sports. There is, however, some disagreement sports coach and also among sports scientists regarding the except meaning of this experts, especially to sports medicine understand sports training as basically doing exercise.

Physical training is one of the most important ingredients in training to achieve high performance. The objectives of physical training are to increase the athlete's physiological potential and to develop bimotor abilities to the highest standards (Tudor O. Bompa, 1999). Sports training is a process of athletic improvement, which is conducted on the basis of specimen principles and through systematic development of mental and physical efficiently, capacity and motivation,

enables the athletes to reproduce outstanding and record breaking athletic performance.

Sports training are science of teaching process which is based on scientific principles and aims at preparing sportsman for higher performance in sports competition. Sports training works for physical exercise and improve their confidence. Physical fitness of human being is the main object of physical education as well as sports training. So the role of sports training in physical education is very important.

Sports training are a "scientifically based and pedagogically organized process which through planned and systematic effect on performance ability and performance readiness aims at sports perfection and performance improvements as well as the contest is sports competition." The skills developed though the sports training programme and physical education are interdependent with ensuring that performance, player or student have success in many of the sports and leisure activities common to the community.

Sports training based on scientific knowledge, is a pedagogical process of sports perfection which through systematic effect on psychology physical performance ability and performance readiness aims at leading the sportsman to high and the highest performance. Through active and conscious interaction with the given demands in sports training, the sportsman's personality develops according to the norms and standards of socialist society.

Sports training is done for improving sports performance. The sports performance is type of human performance and, is not the product of one single system or except of human per sports training, therefore, directly and indirectly aim at improving the personality of sports. No wonder, therefore, sports training is an educational process.

Sports training is a systematic process extending over a long period, for best result training has to be based and conducted on scientific facts and lines. The science of sports training has to be based and conducted on scientific facts and lines. The science of sports its own systematized body of knowledge and hence is a science in itself.

Sport training is an essential element of fitness of virtually every sports man and woman. Long gone are the days when coaches believed resistance exercises only added unnecessary bulk to the athlete, hindering their ability to execute skill. The benefits of sport training to athletic performance are enormous and many. Not only is it an integral conditioning component for power athletes such as football and rugby players, performance in the pure endurance events can be improved with a well structured strength routine.

However, aside from perhaps bodybuilders, sport specific training requires a more refined approach than simply lifting heavy weights to complete exhaustion. A physiological analysis of any game or event will confirm that most athletes required explosive power, muscular endurance, maximal strength or some combination of all

three in order to excel. Rarely pure muscle bulk is the primary concern and when it is other elements of strength are equally as important.

3. Characteristics of sports training

1) A balanced plan and systematicness

Sport training has balanced plan process which touches all the dimensions of individual's personality. Sports' training has also a systematically process which victory of winning can be achieved.

2) Adopt a particular pattern

Sports training adopt a particular pattern which is constantly improved, modified the personality of sportsman.

3) Controlled daily routine

Through sports training a one person can adjust his other activities. Therefore sports person possess a high sense of self discipline. Self discipline quality becomes essential for all champions.

4) It is individualistic

Sports training should be contain with individualistic ability and individualistic performance.

5) Process of perfection

Implementation is major part of sports training. Sports training therefore are a continuous process of perfection.

6) It is based on educational process

Overall development of person can be formulated with the help of sports training. So education process goes on during training.

7) Develops hidden qualities

The sports training aims to find out hidden qualities of sports person and to become aware about one's physical fitness.

8) Helps in confidence building

The basic of sports training is to believe one can win. The most useful tool in building the perfect attitude is practice. It is said that "Practice make man perfect" So through practice sportsman builds his confidence.

4. Principles of sports training

1) Adaptation
2) Overload
3) Progression
4) Specificity
5) Use and disuse
6) Continuity of training
7) Planned and systematic training
8) Constitution

5. Benefits of sports training

1. This is especially important with young athletes who are developing the work habits that stay with them for many years. Sports excellence training teaches the athlete how to achieve proper balance in their lives so that sports do not overshadow personal or family life.
2. Sports mental training can help athletes to achieve excellence by designing customized practice regimens and then giving the individual cognitive tools to stick with the plan every day.
3. Focus training is one of the most important elements in athletic excellence coaching. Counselors and mental trainers can help identify those areas which

are causing athletes to become distracted on the field, and develop solutions that retain their brain and shift focus back to the athletic active.

4. When a golfer or a baseball player loses their swing mechanizes, they can see their career sink rapidly in decline. Sports excellence training uses technology and therapy to help athletes rediscover their swing and maintain it through thousands and thousands of repetitions.
5. Sports excellence training programs provide instant feedback on the athlete's performance. As the program progresses, they can see how, specifically, their training regimen is affecting what they do on the field. This kind of reporting helps individual focus only on those area that need the most work.
6. Sportsman displays the positive attitude towards an active lifestyle.
7. Players play better.
8. Performance for the victory.
9. Sportsman develop physical fitness and enhance physical growth
10. Exhibit more positive attitude towards physical education, physical activities, and games.
11. Develops positive thinking.
12. Have less aggressive behavior of sportsman
13. Excess post exercise oxygen consumption
14. Metabolic adaptation
15. Phosphate metabolism
16. Glycolysis
17. Intramuscular Buffering Capacity

6. Aims of sports training

The sports performance depends on several factors. The performance of a sports person depends on his performance capacity which compiles of five groups of factors. Strength, speed, endurance, flexibility and co-coordinative ability. Factors, therefore, are the principal of sports training. The constitution of physical training is genetically determined and hence cannot be improve by training. But the groups of

factors are trainable to a greater or lesser extent. These four, is therefore, considered to be the aims of sports training.

If you are looking to improve your physical conditioning, training is one of the best cardiovascular and muscle building exercises. Many individuals prefer training because it takes less time than traditional cardio exercises that have you running on a treadmill for thirty to sixty minutes, still consumes a large amount of calories, and utilizes energy burst training that has shown to provide better cardiovascular health.

7. Effect of training on physical education and sports

- Improve physical fitness
- Improve confidence through learning skills and success
- Help children to learn to control their impulses this is necessary for success in short as well as social relationship.
- Help children learn about rules and fair play
- Help children do better at school work.

14-16 years and over

- Children and young people can enjoy the competition and still be learning skills.
- Some children at this age are showing special talent at an interest in a particular sport and can benefit from individual coaching.
- Training at this stage can involve trips away with a team and opportunities for team leadership.
- It is important not to push any young people beyond what they are physically ready for and to find out about what is appropriate in relation to their age and the sport they are playing.

8. Circuit Training

The American "Heritage Dictionary" states that circuit training is a type of interval training in which strength exercises are combined with endurance aerobic exercises, combining the benefits of both a cardiovascular and strength training workout. Circuit means a group of activities and refers to a number of selected stations. Positioned around the facility those are to be visited in repeat succession. The range of stations includes and depends upon to the needs of the components to be developed (e.g. hydraulic equipment or free weights as well as allocated spaces to do squat thrusts, pushups, jumping jacks, sit ups and other exercises. Each person should complete the activity in one station before they process to the next meet station. They then continue until they have passed through all stations once or twice as required or until a certain time requirement has been met.

Interval training refer to organization of any cardiovascular workout e.g. cycling, running, rowing, etc. and is prominent in training routines for many sports. It is a technique particularly employed by runners, but athletes in many disciplines use this type of training.

Interval training is type of physical training that involves a series of low to high-intensity exercise workouts interspersed with rest of relief periods. The high intensity periods are typically at or close to anaerobic exercise, while the recovery periods involve activity of lower intensity. Varying the intensity of efforts exercises the heart muscle, providing a cardiovascular workout, improving aerobic capacity and permitting the person to exercise for longer and /or more intense levels.

9. Interval training

The high intensity periods are typically at or close to an aerobic exercise, while the recovery periods involve activity of lower intensity. Varying the intensity of effort exercises the heart muscle. Providing a cardiovascular workout, improving aerobic capacity and permitting the person to exercise for longer and or more intense levels.

10. The Role of sports training in physical education

In every one's life physical education has a vital role. In physical education sports training have a vital role. Sports training promotes positive attitude to physical education. It also shows enthusiasm for physical education. The sport training motivates to players by accepting rules, terms, conditions and also promotes. Although physical education is an integral part of general education.

Sports training have developed many strategies and exercise for improvement of various factors of physical fitness and sports skill. The sport training guides for 'proper selection criteria'. Proper selection criteria give out proper selection way, proper selection way gives proper performance and lastly proper performance gives victory. The planning and management of sports training should always have player or sportsman as the focus of attention with the overall purpose of providing rich and varied experience.

Sports training also include physical education. Sports' training is also the process through which sports adventure activities like dance, gymnastic are used by the sport training to help student, to learn various skill and achieve physical fitness. Sports training also assist to develop personal and social skill in sportsman. The sport training is an activity that involves specific administration guidance and has historical back ground of rules which define the object and limit the pattern of human behavior. It also involves competition and definite outcome determined by physical skill. The sports training develop one's motor skill. It means develops physical activeness. Being a physically active means strengthening one's internal power and sharpening one's skill.

Sports training aims to improve the performance of sportsman. While giving guidance to sportsman, trainer has all knowledge about physical education, sports. Each sport has different rule, regulation and different type and has different level of physical condition. So sports training gives correct knowledge and information.

Sport training encourages the performance to obey the rules of sports. Sports training give practices to improvement in well being of performer. Sports training guides to player about how to treat opponents with due respect, both in victory as

well as defeat. Sports training also build up the future of the players. For developing a good personality, physical training also build up the future of the players. For developing a good personality, physical education direct to us. Another factor for developing personality three factors play a vital role that is mental, physical and social condition. “Sports performance is the product of total personality” So this performance ability improved the sports training.

With physical education and sports training, abilities of a person can be developed. A person depends on his abilities. His abilities or equalities have significant physical benefits, contributing to others ability to lead long and healthy life, reducing the diseases like diabetes. Through sports training mind can get some exercise and some relaxation.

Efficiency is like a power of every person. The sport training works at increasing power of efficiency. Regular physical activity, proper diet and nutrition are major key of physical fitness but along with proper guideline are also there. The sport training makes us realize the need for proper rest and recovery.

Physical education, “an integral part of total education process, is a field of Endeavour which have as its aim the development of physically, mentally, emotionally and socially fit criticizes through the medium of physical activities which have been selected with a view to realizing the outcomes” So in sports training also total development takes place. Physical educational and the sports training are closely linked to other creative and learning experiences and skill acquisition. It makes a significant contribution to all round harmonious development of the mind and body.

11. Statement of the problem

Sport training is an important part of the learning physical education. Sports training are guiding discipline. So sports training qualities, aims, principles are directly affect on lots of talents. Sports training are nothing but heart of physical education. Physical education also includes sports training. As per my research the role of sports training is beneficial for the physical education. The sport training have

vital factor to develop interpersonal relation. Sports training and physical education help the students invest time in fruitful, competitive activities and enhancing competitive spirit.

12. Importance of the study

The study impact of circuit and interval training on physical and psychologically attribute of boys ranging in the age group of 14-16 years is crucial for the growing age adolescents. Physical and psychological characteristics are very much important in the physical fitness. Similarly, the selected components of circuit and interval training will be helpful in understanding the role played these leads in improving the physical fitness.

13. Hypothesis of the study

1. There exists a positive and significant impact of circuit training on physical traits.
2. Circuit training has crucial effect on psychological traits.
3. There exists a positive and significant impact of interval training on physical traits.
4. Interval training has crucial effect on psychological traits.
5. There is an overall impact of trainings on the physical and psychological traits.

14. Objectives of the study

1. To study the effects of circuit training on physical traits.
2. To know the effects of circuit training on psychological traits.
3. To study the effects of interval training on physical traits.
4. To know the effects of interval training on psychological traits.

15. Scope of the study

Speed, Agility, Strength and flexibility are some of the basic needs in each and every sports activity with variation in their intensity. Various training methods are designed to enhance the fitness components like interval training and interval training etc. The findings of the study will helps to understand the nature of impact exerted by circuit and interval trainings on the physical and psychological aspects of the selected respondents.

16. Limitation of the study

1. The study is restricted to the boys from 14-16 years age.
2. The outcome of the study is limited to the selected sample.
3. Only 100 boys from Netaji Subhash Chandrabose military school Parbhani have been chosen.
4. The study includes important physical and psychological traits.
5. Among the various trainings only circuit training and interval have been selected.

17. Definition of some important concept

Stress: stress is a normal physical response to events that make you feel threatened or upset your balance in some way.

Anxiety: Anxiety is a general term for several disorders that cause nervousness, fear, apprehension and worrying.

Speed: Speed like strength and endurance is a conditional ability. It has a complex nature as it depend to a considerable extent on the central nervous system.

Strength: the ability of a muscle or group of muscles to use force against resistance.

Endurance: Endurance, like strength is a conditional ability. It is primarily determined by energy liberation processes.

Flexibility: Flexibility is a motor ability which is not clearly a conditional or a coordinative ability. It depends party on energy libration processes and partly on the coordinative processes.

Co-coordinative ability

In the past, five motor abilities were recognized as components of physical fitness. These were strength, speed, endurance, flexibility and agility. But since one and a half decade, the term agility has been gradually replaced by the term co-ordination abilities. Co-coordinative abilities have also important and strong links with the motor skill as co-ordination forms the basis of both. Co-ordination abilities become effective in movement only through the motor abilities and active determined drives and cognitive processes.

Internal training:

It is a type of physical training that involves a series of low to high intensity exercise workouts intersperse with rest or relief periods.

II. Review of literature

Venkatesan and Kumaravelue (2009) reveal that heart related problems can be higher in the sedentary people than the trained adult. Plasma glucose was significantly reduced from its higher level due to the influence of circuit and weight training of college men. The study indicates that there was significant reduction in low density lipoprotein (LDL) due to training. The duration of training and change in high density lipoprotein (HDL) level are directly proportional. It was concluded that if the secondary person follow the standard training methods will improve the good and reduce the bad cholesterol. Regular exercises can improve your cholesterol levels (daily work up to 30 to 60 minutes).

Moghe and Deshmukh (2012) indicates that table 'T' with N-1 df find that out T of 6.37 is greater than the 't' needed for significance at the 0.01 level of probability (3.25) therefore, it is concluded that the application of interval training significantly

improve speed performance. The coefficient of correction is positive in respect of experimental group.

William (2015) believe interval training may benefit exercisers by allowing them to burn more calories in a shorter period of time, and by improving aerobic capability at a faster rate, when compared with continuous intensity exercise. In addition, some exercisers find interval training less monotonous than continuous intensity exercise.

Heavin *et al*. (2004) studied at Baylor University and the cooper institute show that circuit training is the most time efficient way to enhance cardiovascular fitness and muscle endurance. Studies show that circuit training helps women to achieve their goals and maintain them longer than other forms of exercise of diet.

Kravitz (2015) claims that perhaps a most profound finding of the study, from a health perspective, is that this investigation clearly shows that performance of this circuit of exercises, this level of intensity elicited oxygen consumption values (39%to 51.5% of VO2 max) that meet established guidelines of the American college of sports medicine (ACSM) for the recommend intensity (40% to 85% of VO2maxR) of exercise for developing and maintaining cardio respiratory fitness. Thus, this circuit not only provides a suitable muscular fitness stimulus but also helps to meet ACSM cardiovascular guidelines and the newly published Dietary Guidelines for Americans 2005 for physical activity.

Randolph (2009) reported that exercise training designs are based upon available research and applications of theoretical knowledge. Since many areas in exercise design have not been thoroughly studies, the value mainly common exercise practices is often employed, one such area is the well accepted technique of performing large muscle group exercise prior to small muscle group exercises during resistance training. The rationale behind this training recommendation is two-fold. First, total force production for the entire workout is greater when large muscle groups are exercised before small muscle groups. Second, when small muscle groups are exercise fits, the force production of the following large muscle groups is decreased. In theory, these tenets support ordering resistance exercise in this way

because it may result in the greatest overall strength gains. In practice, however, then large muscle groups are always exercised before smaller muscle groups, the smaller muscle groups may not become as well trained. If those smaller muscle groups are important in the program of the exercising individual, performance may instead suffer.

II. Research methodology

This chapter will explain the methodological details used to implement the study. Specifically, presented here are the general perspective and of the study, an overview of the participants, a description of the instruments and procedures use in data collection, and an explanation of data analysis

Recherché Design

The formidable problem that follows the task of defining the research problem is the preparation of the design of the research project, popularly known as the “research design”.

Ethical Consideration:

In collecting the data, the researcher follows to ethical guidelines, principles, and standards for studies conducting with human beings. The study will include safeguards for protecting humans, which involve three major ethical principles: beneficence, respect for human dignity, and justice. Beneficence is the protection of participants from physical and psychological harm, exploitation, and performance of some good. The risk/benefit ratio of participation weighs the risk to participants against potential benefits to society. Beneficence implies maximizing benefits over

risks. Respect for human dignity will involve the participant's right to self-determination (freedom to control own activities including participation in study). Justice includes the right to fair treatment (both in the selection of participants and during the course of the study) and right to privacy (through confidentiality procedures that safeguard information that participant's provide)

Measures:

There will be three parts of questionnaires, including 1) Depression Anxiety Stress Scale (DASS); 2) Aggression scale Anand Kumar and pramkumar sukla, 1998

1) Anxiety Stress Scale (Dass)

In assessing the psychological problems the Depression Anxiety Stress Scale (DASS) will be used to measure depression, anxiety, and stress. The DASS is designed to assess aspects of depression, anxiety and stress using a multidimensional approach in adolescents and adults (lovibond & Lovibond, 1955). It is a 42-item self –report measure. Items fall into three scales; Depression (D) Anxiety (A), and Stress (s) with 14 items per scale. Each item is scrod from 0 ("did not apply to me at all") to 3 ("applied to me very much, or most of the time'') in terms of how of the much the item applied within the past week.

2. Aggression scale test: To measure the aggression level of the boys aggression questionnaire was distributed to the in test players. The direct. The directions were read by the researcher at a dictation speed to make the subject understand about what they were exactly required to do. This inventory consisted to 25 items, in which 13 items were keyed "Yes" and rest of the 12 items was keyed "No" The statement which were keyed "yes" were 1, 4, 5, 6, 9, 12, 14, 16, 18, 21, 22, 24, and 25 the statement which were keyed "No'' were 2, 3, 7, 8, 10, 11, 13, 15, 17, 19, 20 and 23

Scoring: For each item score were "1" The maximum score may be 25 and minimum score may be 0.

1. Selection of locale

The studies have been carried out in the Netaji Subhas Chadnrabose military school of Parbhani taluka of the district which comes under the pre view of Marathwada region of Maharashtra state.

2. Selection of sample:

Overall 100 students in the age group of 14-16 years have been selected.

Experimental group : 50 boys

Control group : 50 boys

3. Variables

I. Dependent variables

a. Circuit training
b. Interval training

II. Independent variables

a. Physical attributes
b. Psychological attributes

III. Activities in a circuit training

1. Upper body

a. Squat ups
b. Bench dips
c. Back extensions
d. Medicine ball chest pass
e. Bench lift
f. Inclined press up

2. Core and trunk

a. Sit ups (lower abdominals)

b. Stomach crunch (upper abdominals)

c. Back extension chest raise

3. Lower body

a. Squate jumps

b. Compass jumps

c. Astride jumps

d. Step ups

e. Shuttle runs

f. Hopping shuttles

g. Bench squat

4. Total body

a. Burpees

b. Treadmills

c. Squat thrusts

d. Skipping

e. Jogging

3. Activities in interval training

1. Fartlek interval training

a. Warmup

b. Steady running

c. Hard speed for 2 km

d. Rapid walking for 5 minutes (recovery)

e. Sprints of 50-60 m. interspersed with easy running.

f. Full speed uphill for 200 m.

g. Rapid walking for 1 minute

2. Sprint interval training

a. Walk back sprinting

b. Walk back

c. Sprint again every 3 minutes

c. Selected Physical attributes for the study

1. Strength

a. Maximum strength

b. Explosive strength

c. Strength endurance

2. Speed

a. Movement speed

b. Acceleration ability

c. Locomotors ability

3. Endurance

a. Basic endurance

b. General endurance

c. Specific endurance

4. Flexibility

a. Passive flexibility

b. Active flexibility

c. Co-ordination ability

5. Selected psychological attributes for study

1. Motivation

2. Incentive motivation
3. Avoid failure motivation
4. Achievement success motivation
5. Power motivation
6. Verbal motivation
7. Tangible motivation

3. Aggression

4. Leadership
5. Optimism
6. Impulsiveness
7. Sociability
8. Reliability
9. Activeness
10. Thoughtfulness
11. Controlling

12. Behavior

a. Internal behavior
b. External behavior

13. Emotions

a. Positive emotions
b. Environment that effect emotions
c. Cognitive emotions.

VII. Measurement of variables:

Measurement, calculation and comparison of independent and dependent variables will be carried out with the help of standardized, constructed scale and interview schedule.

VIII. Research design

a. Experimental research design

b. survey method of research

VIII. Statistical test used.

a. Frequency and percentage

c. Mean

d. Standard deviation

e. Pearson's coefficient of correlation

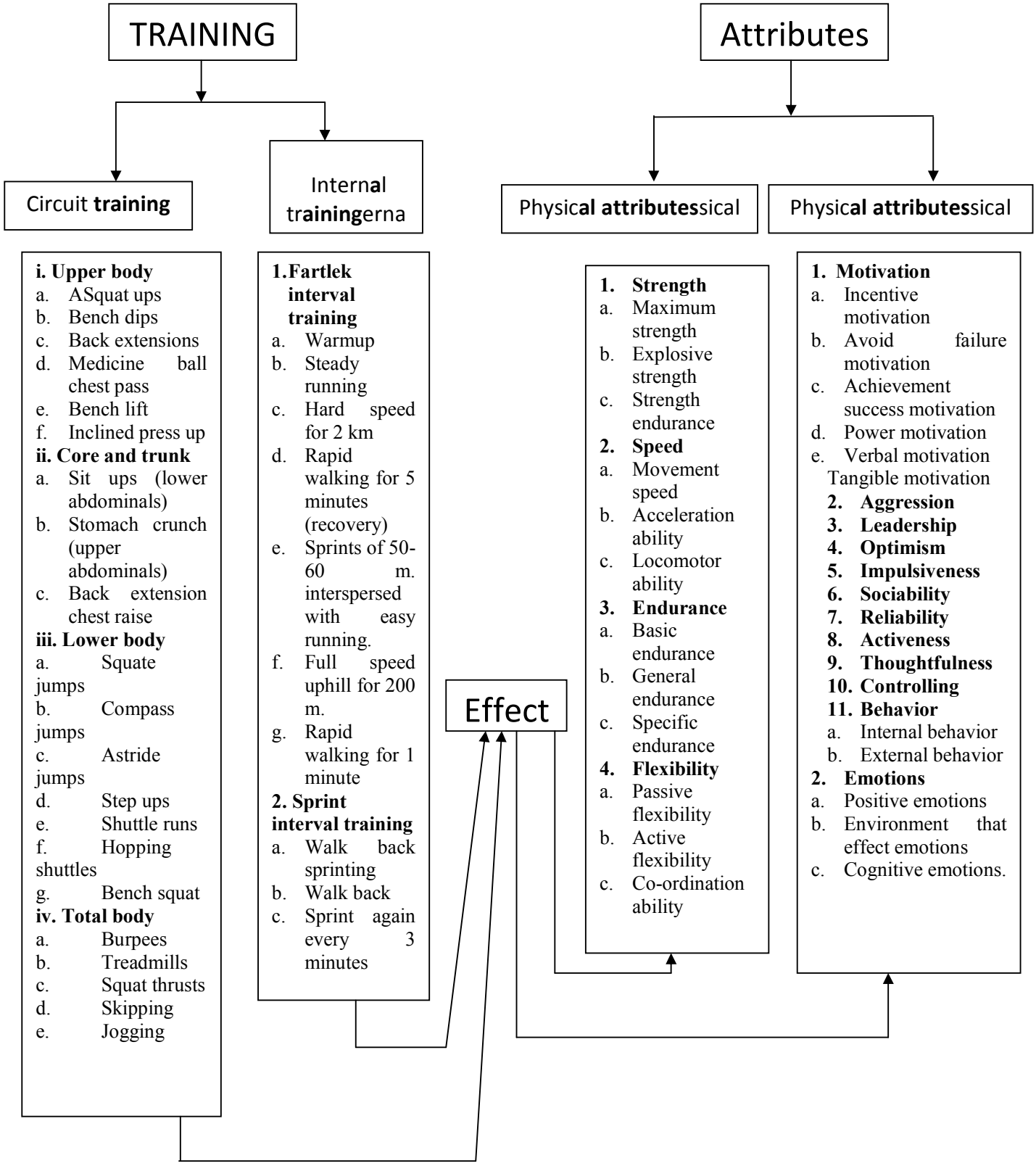
f. Paired t test.

IX. Organization of thesis

The whole thesis has been divided into five chapters.

1. Introduction
2. Review of literature
3. Research methodology
4. Analysis and interpretation of data
5. Summary, conclusion and recommendation.

Bibliography and appendices have been included in the last.



Conceptual model : Effect of circuit training and interval training on physical and psychological attributed among 14-16 years boys.

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Research Guide
Prof. Dr. Ganesh Solanke
M.A., M.P.Ed., Ph.D.
Assistant professor,Sant Tukaram College,
Dist. Parbhani. (M.S.)

Research Scholar
Sudhakar Sakharamji Deshmukh
M.A., M.P.Ed.M. Phil.